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PINNOCK'S CATECHISMS.

CATECHISM

OF

LOGIC.

SEVENTH EDITION, REVISED AND ALTERED.

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A

CATECHISM OF LOGIC.

CHAPTER I.

INTRODUCTION.

Question. WHAT is Logic?

Answer. Logic is the science that instructs us in the principles on which reasoning is founded; it is also the art of applying those principles rightly in conducting an argument.

Q. What is the difference between science and art?

A. A science is a systematic arrangement of facts, and is therefore *knowledge* simply; an art teaches the application of that knowledge to practical purposes.

Q. How does the science of Logic differ from Metaphysics, or the science of mind?

A. Metaphysics treats of the nature of mind generally, Logic only regards those mental faculties which are concerned in reasoning.

Q. How does the art of Logic differ from the art of Rhetoric?

A. The object of Logic is to convince, that of Rhetoric to persuade: by Logic, a thing is shown to

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be right and good; by Rhetoric, motives are supplied for choosing that whose goodness and rectitude has been demonstrated: finally, Logic addresses itself solely to the understanding; Rhetoric, for the most part, to the feelings and passions.

Q. Is Logic a useful branch of learning?

A. Few studies have greater claims upon our attention, since it enables us to dispose our own arguments so as to produce conviction, and to detect the false reasoning of others.

Q. But do we not find persons ignorant of Logic reason correctly?

A. Certainly; and we also find persons ignorant of grammar who speak and write with tolerable correctness; but men would both speak and reason better if they were aided by useful rules for their direction, and were acquainted with the principles on which these rules are founded.

Q. By whom was Logic invented?

A. By Zeno of Elea, whose principal design was to assist the Grecian philosophers in the disputes which they incessantly maintained.

Q. Why then is Aristotle usually esteemed the inventor of Logic?

A. He first reduced the whole into an orderly system, and added so many inventions of his own as to make it appear altogether a new art.

Q. Why has the study of Logic been so much neglected?

A. The followers of Aristotle asserted, that Logic was not only the best, but the only means for *discovering* truth,—a purpose to which it is scarcely applicable; and when the falsehood of this claim was

etected, the world ran into the other extreme, and laid aside the entire art as useless.

Q. Might not another reason be assigned?

A. Yes; there is scarcely any study which requires so much preparation before the learner can perceive its real utility: when people, therefore, cannot perceive some immediate benefit resulting from their application, they fancy that further perseverance would be a useless waste of time; acting as absurdly as the husbandman in the fable, who resigned the culture of his lands altogether, because corn did not appear immediately after his field was ploughed.

CHAPTER II.

Ideas and Terms.

Q. What are the principal mental operations or faculties to which our attention is directed in Logic?

A. There are three principal faculties regarded by Logic; 1. Simple Apprehension, by which we receive ideas; 2. Judgment, by which we compare those ideas; and 3. Reasoning, by which we deduce inferences from those comparisons.

Q. What is an idea?

A. The immediate object of the mind in thought; —that which is present to our mind when we think of any thing.

Q. What is apprehension?

A. The faculty by which we conceive any thing in our minds: it is analogous to perception in the body.

Q. How is apprehension divided?

A. Into two kinds; simple and complex.

Q. How do these differ?

A. When we conceive objects separately, without taking into account any *relation* or connection between them; the apprehension is simple, as of "a man," "a horse," "cards;" but if two or more ideas, between which there is *relation* or connection, be considered, the apprehension is complex, as of "a horseman," "a pack of cards," &c.

Q. What is a term?

A. It is a word expressing an idea; and it is so called, because it *terminates*, or marks out the limits of the idea.

Q. How are terms divided?

A. Into singular and universal.

Q. What is a singular term?

A. A singular term (called by grammarians a proper name), is that which can only be applied to one thing in the same sense. The single thing is called an individual.

Q. Why is it named an individual?

A. Because it cannot be divided into things of the same sort or species. Thus, (to use an old illustration), a leg of mutton is an individual, for though it may be divided into portions, it cannot be divided into legs of mutton.

Q. What is a universal term?

A. That which can be applied to several things in the same sense, as "man," "horse," "star."

Q. Are not the same singular terms frequently applied to several different individuals?

A. Yes; but never in the same sense; Peter the Great, and Peter the Hermit, have the same proper name, but it is not given to them in the sense of

identity, such as when we give the title of man to both these individuals; a Roman general, a black servant, and a pet dog, may be each named Pompey, but the resemblance of name only results from accident, which is not the case when we say that the three individuals are animals.

CHAPTER III.

Abstraction, &c.

Q. What are the most remarkable affections or properties of terms?

A. Comprehension and Extension.

Q. What is the comprehension of a term?

A. It is the aggregate of all the simpler ideas, which, together, make up the complex idea, signified by that term.

Q. What is the extension of a term?

A. It is the aggregate of all the individuals of which that term may be severally predicated or affirmed.

Q. Can you give any instance?

A. The comprehension of the term "man" includes the ideas of "substance, form, life, sensation, reason," &c.; because these simple ideas make up the complex notion of man: the extension of the term man is the individuals James, John, Richard, &c., for to each of these the name man can be applied.

Q. In what are comprehension and extension alike?

A. They are both aggregates or collections.

Q. How do they differ?

A. The parts of comprehension are ideas, and taken collectively; the parts of extension are individuals, and taken separately: the complex notion is changed if any of the parts of comprehension be removed; no alteration is made by the destruction of the parts of extension.

Q. How are universal terms formed?

A. Terms become universal by being made the names of universal ideas; ideas become universal by abstraction.

Q. What is Abstraction?

A. The consideration of attributes common to several individuals; separating from them those which are peculiar to a single individual, but which always accompany them in real existence.

Q. Can you explain this more clearly by an example?

A. The complex notion of any particular man, formed in the mind, contains the simpler ideas of substance, life, reason, &c., together with the ideas of a particular form, and countenance, and existence, in a certain time and place: these latter simpler ideas, or attributes, belong to that individual alone, and distinguish him from all others; but the attributes of substance, body, life, sensation, and reason, belong to a great number of individuals: these then being separated from the peculiarities, and collected together, form what is called the general notion, or universal idea of man; and the process by which this separation is performed, is called abstraction.

Q. Whence arises the necessity of abstraction?

A. All our ideas are, primarily, ideas of individuals; if they so continued, we should have names of indi-

viduals only, and it would be manifestly impossible for men to find a separate name for every separate object; but by the process of abstraction, we separate objects into sorts and classes, to which, when we have given names, we obtain universal terms.

Q. What effect does abstraction produce on comprehension?

A. It diminishes the comprehension, for it omits certain attributes.

Q. What effect does abstraction produce on extension?

A. It increases the extension; for when the peculiar attributes are omitted, the new complex idea becomes applicable to several individuals, whereas before it was limited to one.

Q. How are comprehension and extension connected?

A. The extension of a term, or of the idea signified by that term, depends on its comprehension; for the greater the comprehension, the less will be the extension, and *vice versâ*.

Q. Why?

A. Because every additional attribute, taken into the comprehension of a term, or the idea signified by a term, limits its application to individuals which have a corresponding character: for instance, if, to the general complex idea of man, containing substance, body, life, sensation, and reason, there be added the attribute of whiteness, those individuals who do not possess a white colour, will no longer be contained in its extension.

CHAPTER IV.

Of Judgment and Propositions.

Q. What is judgment?

A. It is the affirmation or negation of one idea about another.

Q. What is a proposition?

A. It is a judgment expressed in words, and may be defined, the affirmation or negation of one term respecting another.

Q. What are the parts of a proposition?

A. Two; the subject and the predicate.

Q. How are they defined?

A. The subject is that about which something is affirmed or denied; the predicate is that which is affirmed or denied concerning the subject.

Q. Does the predicate always follow the subject in the proposition?

A. No; they must be distinguished by the meaning of the sentence, and not by the position of the terms. Thus, when we say, "pleasant are the paths of virtue," *pleasant* is the predicate, and *paths of virtue* the subject.

Q. How is the predicate subdivided?

A. Into the *copula*, and *res copulata;* but the latter, by itself, is most usually named the predicate.

Q. Give me an instance of a proposition and its parts?

A. In the proposition "man is mortal," "man" is the subject, "is" the copula, and "mortal" the res copulata, or predicate.

Q. Is this the form of every simple proposition?

A. No: in common conversation, the copula (which is always the verb substantive, with or without a negative particle) frequently forms one word with the res copulata, as "horses walk;" but for the sake of distinction, logicians, in such cases, use a participle and the verb substantive, instead of the simple verb; thus, the instance given would be resolved into "horses are walking beings."

Q. Whether are subjects or predicates the more general?

A. Any term may be a subject; none but a universal term can be a predicate.

Q. Why cannot a singular term be a predicate?

A. Because being only applicable to one individual, it can be affirmed of that alone, or else the proposition would be identical, as "Peter is Peter."

CHAPTER V.

Predicables and Predicaments.

Q. What is a predicable?

A. That which can be predicated or asserted of any thing. Every universal term is a predicable, for it may be asserted of the individuals contained in its extension.

Q. How many classes of predicables are there?

A. Five; Genus, Species, Difference, Property, and Accident: of these, the two former declare *what* a thing is, the three latter *what kind* it is.

Q. How do you define genus and species?

A. Genus is a universal term, containing in its extension two or more universal terms; Species is a

universal term contained in the extension of one more universal. Thus, "animal" is a genus, for it contains "man" and "beast" in its extension; these latter are species, for they are contained in the extension of animal.

Q. How do you define the other predicables?

A. Difference, called also the Essential Difference, is the name of the principal essential attribute found in the species, but not in the genus (as reason in man); Property, is the name of every essential attribute, except the principal, which is found in the species, but not in the genus; Accident, is the name of a non-essential attribute; that is, an attribute which is found in individuals, but not universally in a class or species (as a white complexion, red hair, &c.).

Q. Which is, genus or species, the more abstract idea?

A. Genus; for it has greater extension, and less comprehension.

Q. How do you prove this?

A. It has greater extension, for it contains the species in its extension; it has less comprehension, for the Essential Difference and the Properties, which are always found in the comprehension of the species, never enter into that of the genus.

Q. Explain the process by which the five predicables are formed.

A. The process of abstraction commences by omitting the attributes which are peculiar to an individual; the preserved attributes form the complex idea of a class or species, the omitted attributes are Accidents; we next remove the attributes peculiar to the

species, which form Difference and Property, while those which we retain form the complex idea of genus.

Q. How are genera and species divided?

A. Genus is either the highest or subaltern; species is either the lowest or subaltern.

Q. Explain this division.

A. In pursuing the process of abstraction, after removing the peculiar attributes, we at length arrive at a single idea, unlimited by any attributes; this is called the Highest genus: the first class which we formed in our process is called the Lowest species: the intervening classes are called subaltern, genera, and species; for they are species with respect to the classes above, and genera with respect to the classes below them.

Q. Explain this by an example.

A. In abstracting the idea of an individual man, we omit the accidents of form, countenance, existence in time and place, &c.; the preserved attributes form the complex idea of the species, man; this is called the lowest species, because it contains only individuals in its extension: we next omit the Essential Difference, or attribute peculiar to that species, viz. reason, and we have the complex idea of Animal, which is a genus, because it contains the species man and beast in its extension; but Animal is also a species, for if we omit the Essential Difference, *sensation,* we form a class above it, Vivens (living thing), which includes animal and plant in its extension: again, omitting the attribute *life,* we form the class Body; and, finally, removing the attribute *form,* we arrive at substance, which is the highest genus, be-

cause it is contained in the extension of no more general term.

Q. What is a predicament?

A. A predicament, called also a category, is the highest genus, with all the classes, &c. that are contained in its extension.

Q. What is a predicamental line?

A. A series of classes, commencing with the lowest species, and terminating with the highest genus. For instance, the series Man, Animal, Vivens, Body, Substance, is a predicamental line.

Q. How many predicamental lines are there in a predicament?

A. As many as there are lowest species.

Q. Which is, predicament or predicable, the more extensive term?

A. Predicament; for it contains singular terms which are excluded from the classes of predicables.

Q. How many predicaments, or categories, were enumerated by the old logicians?

A. Ten:—viz. Substance; Quantity, with its three species, number, time, and magnitude; Quality, with its four species, habit, natural power, patible quality, form, and figure; Relation, Action, Passion, Where, When, Posture, and Habit.

Q. How does Time, a species of quantity, differ from the category When?

A. The former relates to the time *how long*.

Q. What do you mean by patible qualities?

A. Those qualities of body which the mind is passive in receiving.

Q. What is the difference between habit, a species of quality, and habit, the last category?

A. The former signifies custom, the latter dress.

Q. What do you mean by relation?

A. Relation takes place when the consideration of one idea necessarily includes the consideration of another; thus, the idea of parent includes that of child, the idea of master that of servant, &c. The idea, primarily considered, is called the *Relate*, or the subject of relation; that, whose consideration is included, is called the *Correlate*, or term of the relation; and their names are called relative and Correlative terms.

Q. What was the object of classifying the predicaments?

A. As the predicables contained the predicates of propositions, it was designed to include the subjects in the classes of predicaments.

CHAPTER VI.

The absolute affections of propositions.

Q. How are propositions divided?

A. Into simple and compound.

Q. What is the difference between them?

A. A simple proposition cannot be resolved into several; a compound may be divided into several simple.

Q. How are the affections or properties of propositions divided?

A. Into the Absolute, or those which belong to a proposition considered by itself; and the Relative affections which result from the comparison of several propositions with each other.

Q. What are the absolute affections of propositions?

A. Quantity and Quality.

Q. What is quantity?

A. The determination of the extension of the subject in a proposition: it is either universality or particularity. With respect to quantity, propositions are divided into universal and particular.

Q. What is quality?

A. The nature of the assertion made in a proposition; it is either affirmation or negation. With respect to quality, propositions are divided into affirmative and negative.

Q. What is a universal proposition?

A. That in which the subject is distributed, or taken in its entire extension. If the subject be a universal term (see Chap. II.), a mark of universality, such as "all, every, none," is, for the most part, prefixed; but if the subject be a singular term, no such mark is required, because a singular term being only applicable to one individual, must always be taken in its entire extension.

Q. What is a particular proposition?

A. That whose subject is not distributed or taken in its entire extension. The subject must, in this case, be a universal term; and to show that it is taken particularly, a mark of *uncertain* quantity, such as "some, many, a few, &c." is usually prefixed.

Q. Why do you use the word *uncertain?*

A. Because, if the quantity were certain, it would individualize the subject, and make it in fact a singular term; now we have already shown, that propositions, whose subjects are singular, belong to the class of universals. Propositions, whose subjects

have a mark of certain quantity, are usually termed Collective.

Q. What is an affirmative proposition?

A. That in which the predicate is said to agree with the subject, or more properly, to contain the entire extension which the subject has in that proposition.

Q. When will this be the case?

A. When the entire comprehension of the predicate is contained in the comprehension of the subject.

Q. What is a negative proposition.

A. That in which the predicate is said to disagree with the subject, or more properly, to exclude the entire extension which the subject has in that proposition.

Q. When will this be the case?

A. When there are one or more ideas in the comprehension of the predicate, which are not contained in the comprehension of the subject, nor in any of its parts.

Q. How are propositions divided with respect to quantity and quality taken together?

A. Into four classes, marked for convenience by the four vowels, as follows:—

A a universal affirmative,
E a universal negative,
I a particular affirmative,
O a particular negative.

Q. What is the matter of a proposition?

A. The nature of the connection between the subject and predicate: it is three-fold, necessary, impossible, and contingent.

Q. How are these three kinds of matter distinguished?

A. If the predicate agree with all the individuals of the subject, as in A, the matter is said to be necessary; if it disagree with all, as in E, the matter is said to be impossible; if it agree with some, and disagree with others, as in I and O, the matter is said to be contingent.

Q. What is an indefinite proposition?

A. That in which the matter is not strictly defined, as "mothers love their children," "men do not voluntarily incur loss:" in these cases, the extent of the agreement or disagreement between the subject and predicate, cannot be discovered from the terms of the proposition, and therefore such propositions are excluded from strict logical reasoning.

CHAPTER VII.

Truth and Falsehood.

Q. How many kinds of truth are there?

A. Two; Logical and Ethical: of course there are the same varieties of falsehood.

Q. How are these kinds distinguished?

A. Logical truth is the agreement of an assertion with the reality of things; Ethical truth its agreement with the judgment of the mind.

Q. When will the same proposition be both logically and ethically true or false?

A. When the mind forms a correct judgment.

Q. What inferences can be deduced when the mind forms a correct judgment?

A. We may infer, that a proposition ethically true will be logically true, and that a proposition ethically false will be logically false, and *vice versâ.*

Q. What inferences may be deduced when the mind forms an incorrect judgment?

A. We may infer, that a proposition logically true will be ethically false, and *vice versâ;* but we cannot infer that a proposition logically false will be ethically true, nor that a proposition ethically false will be logically true.

Q. Why can we not?

A. There is only one truth; the varieties of falsehood are infinite; for instance, I may suppose that this book contains one hundred pages, and with ethical falsehood assert, that it contained any other number; but the mental falsehood of my assertion would not manifestly constitute logical truth.

CHAPTER VIII.

The affections of the terms of a proposition.

Q. Have terms any relative affection?

A. Yes; in a proposition they are said to have quantity.

Q. Why is this a relative affection of propositions?

A. Because quantity, that is, universality or particularity, does not belong to the terms taken by themselves, but is determined by the nature of the proposition in which they are found.

Q. In this relative sense, what is a universal term?

A. A term distributed or taken in its entire extension.

Q. What is a particular term?

A. A term not distributed; that is, not taken in its entire extension.

Q. On what does the quantity of the terms of a proposition depend?

A. The quantity of the subject depends on the quantity of the proposition; the quantity of the predicate on the quality of the proposition.

Q. How does the quantity of the subject depend on the quantity of the proposition?

A. In every universal proposition, the subject is universal, and in every particular proposition, particular; as is plain from the definitions in Chap. VI.

Q. How does the quantity of the predicate depend on the quality of the proposition?

A. In every affirmative proposition the predicate is particular, and in every negative it is universal.

Q. Why is the predicate of an affirmative proposition particular?

A. The assertion of an affirmative proposition is, that the predicate contains the extension of the subject; from thence, it cannot be inferred, that the predicate contains nothing more; as therefore only part of its extension can be inferred from the proposition, it must be considered particular.

Q. But is not the predicate of an affirmative proposition sometimes taken in its entire extension?

A. When the terms of an affirmative proposition are reciprocal, as "man is a rational animal," the predicate is really taken in its entire extension; but it must still be considered as particular, because its universality is inferred from knowledge extrinsic to the proposition.

Q. What do you mean by reciprocal terms?

A. Terms which may be universally predicated of each other.

Q. Why is the predicate of a negative proposition universal?

A. The assertion of a negative proposition is, that the extension of the subject is excluded from the *entire* extension of the predicate; consequently, the predicate is taken in its entire extension, and is therefore universal.

CHAPTER IX.

The relative affections of propositions. Subalternation.

Q. How many relative affections of propositions are noticed by Logicians?

A. Three; Subalternation, Conversion, and Opposition.

Q. What is subalternation?

A. The deduction of a particular or singular proposition, from a universal, without transposing the terms. The universal proposition is called the *subalternans;* the inferences deduced from it are named subalterns. Thus, from the subalternans, "every man is an animal," we may deduce the subalterns, "some men are animals," "Peter is an animal," &c.

Q. What are the canons respecting the determination of truth and falsehood in this process?

A. There are four; but the two last may be inferred from the others:—

1. The truth of the universal infers the truth of the particular.

2. The truth of the particular does not infer the truth of the universal.
3. The falsehood of the particular infers the falsehood of the universal.
4. The falsehood of the universal does not infer the falsehood of the particular.

Q. How do you prove the first and third?

A. If the predicate contain (or exclude) the whole extension of the subject, it must contain (or exclude) a part; and on the other hand, if it be false that part of the extension of the subject is contained in (or excluded from) the extension of the predicate, it must be false that the whole is contained (or excluded).

Q. How do you prove the second and fourth?

A. Though it be true that the predicate contains a part of the extension of the subject, it may be false that it contains the whole; and on the other hand, though it be false that the whole subject is contained in the predicate, yet, it may be true, that a part is contained in its extension.

Q. What practical rule is derived from these axioms?

A. That an argument from a particular to a universal is invalid.

Q. What do you mean by this rule?

A. That any argument from *a term* taken in part of its extension, to *the same term* taken in the whole of its extension, is invalid.

Q. Why do you lay such stress on the word *term?*

A. To shew that the rule has no reference to propositions, for in the third canon of subalternation we legitimately reason from a particular *proposition* to a universal.

CHAPTER X.

Conversion.

Q. What is conversion?

A. The legitimate inference of one proposition from another, by the transposition of the terms. The original proposition is called the convertend, that deduced from it the converse.

Q. How many species of conversion are there?

A. Three; simple conversion, in which the converse preserves the quantity and quality of the convertend; conversion *per accidens*, in which the quantity is diminished but the quality preserved; and conversion by contraposition, in which the quality is changed.

Q. How are these species of conversion used?

A. Universal negatives, and particular affirmatives, are converted simply; universal affirmatives are converted *per accidens;* particular negatives can only be converted by contraposition; and, as this species is rarely used, they are generally said to be incapable of conversion.

Q. In what manner are these facts usually stated by logicians?

A. A is converted into I,
E is converted into E,
I is converted into I,
O is not converted. (See Chap. VI.)

Q. In what manner can you prove that A is converted into I?

A. The assertion of a universal affirmative is that

the entire extension of the subject forms part of the extension of the predicate, from whence it manifestly follows that a part of the individuals contained in the extension of the predicate is the same as those contained in the extension of the subject; but no inference can be made respecting the entire extension of the predicate, consequently the subject of the converse must be particular and the converse itself affirmative.

Q. How do you prove that E is converted into E?

A. The assertion of a negative proposition is that the extension of the subject is excluded from the entire extension of the predicate and from all its parts; consequently the whole extension of the predicate is totally different from the extension of the subject, therefore, the subject of the converse is universal, and the converse negative.

Q. How do you prove that I is converted into I?

A. The assertion of a particular affirmative is, that part of the extension of the subject agrees with part of the extension of the predicate; consequent, part of the extension of the predicate agrees with part of the extension of the subject, therefore, the converse will be particular and affirmative.

Q. Why cannot O be converted?

A. The assertion of a particular negative is, that part or the extension of the subject is excluded from the extension of the predicate. This may be the case when the extension of the predicate is contained in extension of the subject, as "some animals are not men;" or when the extension of the predicate is excluded from the extension of the subject, as "some men are not stones," or finally when it is partly con-

tained, and partly excluded, as "some men are not white;" therefore, in a particular negative, there is nothing by which the quantity and quality of the converse can be determined.

Q. What is the peculiarity of conversion by contraposition?

A. In this species of conversion the contradictions of the terms are substituted for the terms themselves; thus, "every man is an animal," becomes, "whatever is not an animal is not a man."

Q. Are there no means by which a particular negative may be converted?

A. It may be converted by contraposition, or what is virtually the same, by joining the negative particle to the predicate, and considering the proposition as a particular affirmative; thus, "some animals are not rational beings," may be converted into "some not rational beings are animals."

Q. When does a universal affirmative appear susceptible of simple conversion?

A. When the terms are reciprocal; but this is not legitimate conversion, as the converse is not deducted from the convertend.

Q. What changes are made in conversion by contraposition?

A. A is converted into E,
E is converted into I,
I is not converted,
O is converted into I,

as easily appears from the proofs of the other species of conversion given in the commencement of this chapter.

CHAPTER XI.

Opposition.

Q. What is opposition?

A. Opposition is the disagreement in quality between two propositions, having the same subject and the same predicate.

Q. How many species of opposition are there?

A. Three; contradiction, contrariety, and subcontrariety.

Q. What is contradiction?

A. It is the opposition between a universal and particular, or between two singulars. Of contradictories, one is always true and the other false.

Q. Prove the canon of contradiction.

A. If the matter of the proposition be necessary, the affirmative will be true and the negative false; if impossible, the negative will be true and the affirmative false; if contingent, the universal will be false and the particular true. In singular propositions it is evident that the same attribute cannot agree and disagree with the same thing at the same time.

Q. What is contrariety?

A. The opposition between two universals. Of contraries both may be true, but both cannot be false.

Q. How do you prove the canon of contrariety?

A. In necessary matter, the affirmative will be true and the negative false; in impossible matter, the negative will be true and the affirmative false; in contingent matter, both will be false.

Q. You said in Chap. VI. that singular proposi-

tions are reduced to the class of universals, why then is the opposition between singular propositions reckoned a part of contrariety?

A. Because that would violate the canon of contrariety, for singular opposites cannot both be false.

Q. What is subcontrariety?

A. The opposition between two particulars; subcontraries may be both true, but cannot both be false.

Q. How do you prove the canon of subcontrariety?

A. If the matter of the proposition be necessary, the affirmative is true and the negative false; if impossible, the negative is true and the affirmative false; if contingent, both are true.

Q. What objection is there to subcontrariety, as a legitimate species of opposition?

A. The subjects of the subcontrary opposites may be different parts of the extension of the term, and, thus, though apparently the same, be really different.

Q. When will this certainly be the case?

A. When the subcontraries are true, for the same attribute cannot agree and disagree with the same thing at the same time.

Q. Can you shew that when contraries are false, subcontraries will be true?

A. Contraries are A and E, by hypothesis they are both false, therefore their contradictions, O and I (by the canon of contradiction) must be both true, but these are subcontraries.

CHAPTER XII.

Definition and Division.

Q. How many kinds of definition are there?

A. Two; definition of a name, or of a thing.

Q. What is the definition of a name?

A. The explanation of a word which was before unknown, as "Algebra *signifies* the art of computing by symbols."

Q. How can you best judge of the truth in any definition of a name?

A. By substituting the definition for the word in any given sentence, and thus seeing whether it will bear the signification under all circumstances.

Q. What is the definition of a thing?

A. It is a proposition explaining what any thing is.

Q. What are the laws of a perfect definition?

A. 1. It must be adequate, that is, it must contain the whole thing defined and nothing more. 2. It must be clear, so as to make the nature of the thing defined intelligible.

Q. Of what does a perfect logical definition consist?

A. Of the proximate genus and essential difference. Such a definition will always be adequate, for the genus contains the entire thing defined, and the essential difference excludes every thing else; but it will not always be clear, for the genus may need definition as much as the species.

Q. What is an imperfect definition called?

A. It is properly termed a description.

Q. How many kinds of description are there?

A. Two. 1. A proposition declaring the nature of a thing, imperfectly by essential attributes. 2. By non-essential attributes, as "man is a two-legged featherless animal.[1]"

Q. How many species of division are there?

A. Two; division of a name, and division of a thing.

Q. What is division of a name?

A. The enumeration of the meanings of an ambiguous word or a doubtful sentence.

Q. What is the division of a thing?

A. The distribution of a whole into its parts.

Q. Is not the word *whole* ambiguous?

A. Yes, it may mean either a universal whole or an integrant whole.

Q. What do you mean by a universal whole?

A. That whose name is a universal term; if it be a genus, its parts are species; if it be a species, its parts are individuals; in either case the parts are called subjective.

Q. Why are they named subjective?

A. Because they may be the subjects of affirmative propositions, of which the whole would be the predicate, and also because they are placed under it

[1] This notable attempt at definition boasts of a not less respectable author than Plato: it was practically refuted by Diogenes, who presented himself in the academy where Plato was lecturing, and taking from under his cloak a cock, which he had stripped of its feathers, threw it on the ground, exclaiming, "There's Plato's man for you!"

(subjectæ sunt) in the predicamental line. (See Chap. V.)

Q. What do you mean by an integrant whole?

A. Any entire individual thing, as a nation whose integrant parts are provinces, a man whose integrant parts are body, head, members, &c. The division of an integrant whole, is commonly called partition.

Q. Have we had any instance in this work, of the same thing divided universally and integrantly?

A. Yes; propositions as universal wholes are divided into simple and compound, universal and particular, &c.; but as an integrant whole, a proposition is divided into subject and predicate.

CHAPTER XIII.

Compound, Hypothetic, and Modal Propositions.

Q. How many species of compound propositions are there?

A. Two; those compounded in words and those compounded in sense.

Q. Which are the most remarkable kinds of propositions compounded in words?

A. Copulatives and disjunctives.

Q. What is a copulative proposition?

A. A proposition containing several subjects, or several predicates, or both connected together by a copulative particle, as Aristotle was the preceptor of Alexander the Great, and the inventor of logic.

Q. On what does the truth of a copulative proposition depend?

A. On the truth of all the parts separately.

Q. Into how many parts may a copulative proposition be resolved?

A. As many as there are subjects multiplied by the number of predicates, for each predicate may be asserted of each subject.

Q. Is there not a species of copulative proposition in which something more than the mere truth of the parts is required?

A. Yes; in an adversative proposition there must be an apparent opposition between the parts, or it will be nonsensical.

Q. What is an adversative proposition?

A. That in which one of the adversative particles, "but, yet, although," &c. occurs, as "though he were wounded, yet did he not complain." Every person perceives that it would be nonsense to say "though he were gratified yet did he not complain."

Q. What must be the species of opposition between the parts of an adversative proposition?

A. Subcontrariety; if it were either of the other species; the parts would not be true. (See Chap. XI.)

Q. What is a disjunctive proposition?

A. That in which the subject is said to be contained in one of two or more predicates; these predicates are in fact the parts of some whole, and on their perfect enumeration the truth of the disjunctive depends; as "it is either spring, summer, autumn, or winter," where the four predicates enumerate all the varieties of season. (See the subject of division in the preceding chapter).

Q. Which are the principal kinds of propositions compounded in sense?

A. Exclusives, exceptives, and inceptives or

desitives; they are called by a common name exponibles.

Q. Why are they named exponibles?

A. Because they want exposition to point out their latent composition.

Q. What is an exclusive proposition?

A. That in which the predicate is said to agree with the subject alone, all others being excluded, as "virtue alone is true nobility." This is resolved into two parts; 1. the predicate agrees with the subject. 2. It disagrees with every thing else.

Q. What is an exceptive proposition?

A. That in which the predicate is said to agree with the subject, a part being excepted. It is resolved into two: 1. the predicate does not agree with the excepted part; 2. it agrees with all the rest.

Q. Are not exclusives and exceptives very similar?

A. Yes; they merely differ in the form of expression.

Q. How may an exclusive be changed into an exceptive?

A. By making the subject of the exclusive the excepted part of the exceptive, and changing the quality.

Q. What is an inceptive or desitive proposition?

A. That in which something is said to begin or end. It is resolved into two: 1. stating the condition before the change; 2. the effect of the alteration.

Q. By what common name are all the kinds of propositions hitherto mentioned known?

A. They are called direct or categorical propositions, because they contain a direct assertion.

Q. Are there any other species?

A. Yes; the assertion may be stated in the form of a supposition as in hypothetics; the extent of the connection between the subject and predicate may depend on the connection between some other subject and predicate, as in comparatives; besides the fact of connection between the subject and predicate, there may be a qualifying assertion stating the mode or manner of connection as in the Modal propositions.

Q. What is a hypothetic proposition?

A. Two or more categorical propositions united by the hypothetic conjunction "if;" it has commonly an *illative* force, that is, the latter part is said to be the consequence of the preceding, as "if a triangle be isosceles, the angles at its base are equal."

Q. What are the parts of an hypothetic proposition?

A. The antecedent, which contains the supposition, and the consequent, which states the inference to be deduced from that supposition.

Q. On what does the truth of a hypothetic proposition depend?

A. On the validity of the inference of the consequent from the antecedent. There is no truth requisite in the separate categorical propositions, for they may be true, and the hypothetic false, as "if the moon be spherical, it revolves round the earth;" or the parts may be false and the hypothetic true, as "if the moon shone by its own light, it would always appear with a spherical disc."

Q. Is there not another species of proposition sometimes included under hypothetics?

A. Disjunctive propositions, which have been already mentioned, are by some logicians considered a species of hypothetics; so also are causals, they are in

form the reverse of hypothetics, for the preceding part is said to be the consequence of what follows; as "the moon has various phases, because she shines with the reflected light of the sun."

Q. In what other respect do causals differ from hypothetics?

A. The truth of the parts is necessary to the truth of a causal proposition.

Q. What is a comparative proposition?

A. That in which a comparison is instituted, as "Cicero was as eloquent a speaker as Demosthenes;" from the assertion of such a proposition, nothing can be determined categorically of the parts, for I may say "Turpin was as honest as his associates," though there was not a particle of honesty among them.

Q. What is a modal proposition?

A. That in which a mode or qualification of the assertion occurs, as "it will *probably* rain to-day," "human society is *necessarily* held together by laws."

Q. What are the parts of a modal proposition?

A. The assertion and the mode; and when a modal proposition is considered as simple, the assertion becomes the subject, and the mode the predicate. In this view the examples quoted, should be more properly expressed,

subject *predicate*
"That it will rain to-day, is a probable thing;"

subject
"That human society should be held together by law,"

predicate
is a necessary thing.

Q. How many modes were recognized by the old logicians?

A. Only four; necessary, impossible, possible, and contingent.

Q. How did they define these modes?

A. Necessary, that which is and must be.
Impossible, that which is not and cannot be.
Contingent, that which is and may not be.
Possible, that which is not but may be.

Q. How have these modes been extended by modern logicians?

A. Modern writers on logic consider every thing a mode which qualifies the nature or extent of the connection between the subject and predicate.

CHAPTER XIV.

Reasoning and Syllogism.

Q. What is reasoning?

A. The inference of one judgment from several.

Q. What is reasoning, when expressed in words, called?

A. Argumentation.

Q. What is the most usual species of reasoning?

A. The inference of one judgment from two.

Q. By what name do logicians call this species of reasoning, when expressed in words?

A. They term it a syllogism.

Q. How then do you define a syllogism?

A. The inference of one proposition from two.

Q. What is the usual process by which a syllogism is formed?

A. When in argumentation a proposition occurs, respecting the agreement or disagreement of whose subject and predicate, a doubt is entertained, it is (for the most part) reduced into a simple categorical form

and termed *the question*, as, for instance, "whether the earth be a globe?" In order to determine the connection between the terms of this question, they are each compared with some third term; suppose in this instance, with the nature of the shadow which they cast, and from their relation to this third term, their mutual connection is inferred. This inference is called *the conclusion*, which has manifestly the same terms as the question, and only differs from it in having a determinate quality.

Q. How many terms are there, consequently, in a simple syllogism?

A. Three; the terms of the question (or conclusion) which are called extremes, and the term with which they are compared, usually denominated the middle term.

Q. How are the extremes distinguished?

A. The subject of the question (or conclusion) is called the minor term, and the predicate is denominated the major term.

Q. Why have they received these names?

A. Because in a universal affirmative proposition, which logicians consider the most perfect and useful, the predicate has always as great, and for the most part greater extension than the subject; it is, therefore, termed Major, *(greater)* and the subject is called Minor, *(less)*.

Q. Is there any other reason for selecting a universal affirmative besides its utility?

A. That is the only species of proposition in which the relative extension of the terms can be determined, for in both the species of negatives, (E and O) the extension of the subject being excluded from that of the predicate, no comparison can be instituted be-

tween them; and in particular affirmatives, (I), the subject and predicate being both taken only in part of their extensions, nothing can be determined respecting the entire extension of these terms.

Q. You have said that a syllogism contains only three terms, and yet that it consists of three propositions; how are these propositions formed?

A. Each term is twice repeated; in the first, the extreme major is compared with the middle; this is, therefore, called the major proposition; in the second, the minor extreme is compared with the middle, and the proposition is termed the minor; in the conclusion, the extremes are compared together.

Q. What common name have the major and minor propositions?

A. They are called premises.

Q. Give an example of a syllogism and its parts?

A. Major premises:

middle term
Every body that in every position casts a circular shadow,
major term
is a globe.

minor term
Minor premises: The earth is,
middle term
A body that in every position casts a circular shadow.

minor term *major term*
Conclusion. Therefore, The earth is, a globe.

Q. What species of matter are syllogisms said to have?

A. Two kinds; proximate and remote.

Q. What is the proximate matter of a syllogism?

A. The propositions which compose the syllogism, viz. the premises and conclusion.

Q. What is the remote matter of a syllogism?

A. The terms of which the propositions are composed, viz. the extremes and the middle term.

CHAPTER XV.

Form and Figure of Syllogisms.

Q. What property have syllogisms with respect to their proximate matter?

A. Form.

Q. What is the form of a syllogism?

A. The proper arrangement of the premises, so as to point out the necessary inference of the conclusion.

Q. What is the usual form of a syllogism?

A. The major proposition is generally placed first, as in the example given in the preceding chapter.

Q. What property have syllogisms with respect to their remote matter?

A. Figure.

Q. On what do the varieties of figure depend?

A. On the position of the middle term in the premises.

Q. How many varieties of figure are there?

A. Four; because the middle term may have four different positions in the premises.

Q. What position does the middle term hold in the first figure?

A. It is the subject of the major, and the predicate of the minor, as in the example given in the preceding chapter.

Q. What is the position of the middle term in the second figure?

A. It is the predicate of both premises; as

major term
No body that has not less specific gravity than itself
middle term
can revolve round the earth;
minor term *middle term*
The moon revolves round the earth;
Therefore,
The moon has less specific gravity than the earth.

Q. What is the position of the middle term in the third figure?

A. It is the subject of both premises; as

middle term
Those celestial objects, which change their relative
major term
positions, are planets;
middle term *minor term*
Such changes of position are seen among the stars;
Therefore, "Some of the stars are planets."

Q. What is the position of the middle term in the fourth figure?

A. It is the predicate of the major, and the subject of the minor; on account of the unnatural position of its terms, it was not recognised by Aristotle; but being subsequently introduced by Galen, it is sometimes termed the Galenic figure. As it rarely occurs in practice, there is no necessity of giving an example.

CHAPTER XVI.

General Rules of Syllogisms.

Q. On what axioms was the doctrine of syllogisms founded before the time of Aristotle[1]?

[1] Aristotle's doctrine of syllogisms will be found in Chap. XIX.

A. On the three following:—

1. If two things agree with one and the same third, they agree with each other.

2. If of two things one agree and the other disagree with the third, they disagree with each other.

3. If neither agree with the third, no inference can be deduced.

Q. How many general rules of syllogisms are there?

A. Six: 1. The middle cannot be taken twice particularly, but must be at least once universal.

2. An extreme cannot be taken more universally in the conclusion than in the premises.

3. From two affirmative premises a negative conclusion does not follow.

4. From two negative premises nothing follows.

5. The conclusion follows the weaker part; that is, if one premise be negative, the conclusion will be negative; and if one premise be particular, the conclusion will be particular.

6. From two particulars nothing follows.

Q. How do you prove the first rule?

A. If the middle were taken twice particularly, it might be taken for different parts of the same universal whole, and thus there would be in fact two middle terms; but it appears, from the axioms, that the extremes should be compared with one and the same third.

Q. Is not this rule very frequently violated by inaccurate reasoners?

A. None more so; because the similarity in sound prevents us from immediately perceiving the dissimilarity in sense, when an ambiguous or undistributed middle is used; thus, in the common jest;

Whoever says you're an animal, says true;
Whoever says you're a goose, says you're an animal;
Therefore, whoever says you're a goose, says true.
The fallacy lies in the middle term, "animal," being taken in only part of its extension in both the premises, viz. only so much in the major as agrees with the term, man; and so much in the minor as agrees with the term, goose. (Though the instance given be rather ludicrous, yet it will aid the learner in the detection of similar fallacies on more important occasions.)

Q. How do you prove the second general rule?

A. If an extreme were taken more universally in the conclusion than in the premises, we should argue from a particular to a universal, contrary to the rule established in Chap. IX.

Q. How do you prove the third general rule?

A. If there be but one middle, both extremes agree with it, and cannot therefore disagree with each other; if there be two middle terms the axioms are violated.

Q. How do you prove the fourth general rule?

A. It follows immediately from the third axiom.

Q. Into how many parts is the fifth general rule divided?

A. Two: first, if one premise be negative, the conclusion will be negative, which follows immediately from the second axiom; 2dly. If one premise be particular, the conclusion will be particular.

Q. How is the second part proved?

A. If both premises be affirmative, there can be only one universal term in the premises (Chap. VIII.), and that, by the first general rule, must be the middle term; therefore, the minor term, being particular in

the premises, must, by the second general rule, be particular in the conclusion, where it is the subject, and therefore renders the conclusion particular.

If one of the premises be negative, the conclusion, by the first part of this rule, must be negative, and its predicate consequently universal (Chap. VIII.); in this case, there can be only two universal terms in the premises, one of which must be the middle, and the other the major (first and second general rules); therefore, the minor being particular in the premises, will be also particular in the conclusion, where it is the subject, and consequently renders the conclusion particular.

Q. How do you prove the sixth general rule?

A. If both premises be affirmative, there will be no universal term in the premises, and therefore the middle will be taken twice particularly, contrary to the first general rule. If one premise be negative, the conclusion will be negative, and therefore its predicate universal; but in this case there can be only one universal term in the premises; therefore, either the middle must be taken twice particularly, contrary to the first general rule, or the major extreme must be taken more universally in the conclusion than in the premises, contrary to the second.

CHAPTER XVII.

Modes and special rules.

Q. What is the mode of a syllogism?

A. The legitimate determination of the propositions in a syllogism, according to their quantity and quality.

Q. What do you mean by the special rules of a syllogism?

A. Those rules which are peculiar to any single figure.

Q. How may we determine the rules which are special to the first figure?

A. The conclusion must be either affirmative or negative. If it be affirmative, both premises, and therefore the minor, must be affirmative; but the middle term, which, in this case, is predicate of the minor, will be particular, and therefore must be universal in the major, where it is the subject, and consequently renders the major universal.

If the conclusion be negative, its predicate, the major term, will be universal, and must consequently have the same quantity in the major premise; but in the major premise, it is the predicate: therefore, the major must be negative, and the minor affirmative; consequently, its predicate, the middle term, will be particular in the minor, and therefore universal in the major, where it is the subject, and consequently renders the major universal.

Q. What special rules for the first figure are deduced from this analysis?

A. 1. The major must be universal.

2. The minor must be affirmative.

Q. What are the legitimate modes of the first figure established by the same analysis?

A. Four; as follow:—

	1.	2.	3.	4.	
Major premise	A	E	A	E	
Minor premise	A	A	I	I	
Conclusion	A	E	I	O	(See Chap. VI.).

Which, for the sake of memory, are formed into the mnemonic word, *Barbara, Celarent, Darii, Ferio.*

Q. How do you investigate the special rules of the second figure?

A. As the middle term is predicate of both premises, one of them must be negative (first general rule), and the conclusion must also be negative (fifth general rule); consequently, the major term, as predicate of the conclusion, will be universal, and must therefore (second general rule) have the same quantity in the major premise, where it is subject, and therefore renders that premise universal.

Q. What are the general rules deduced from this analysis?

A. 1. One of the premises must be negative:
2. The major must be universal.

Q. What are the modes of the second figure according to this analysis?

A. There are four:—

	1.	2.	3.	4.
Major premise	E	A	E	A
Minor premise	A	E	I	O
Conclusion	E	E	O	O

Contained in the technical words, *Cesare*, *Camestres*, *Festino*, *Baroko*.

Q. What are the special rules of the third figure?

A. It can be shewn by the same analysis as in the first figure; that 1. the minor must be affirmative; and since the minor term is predicate of the minor proposition, it must be particular, and therefore the conclusion will be particular.

Q. From what similarity between the first and third figure have they a similar rule and similarly proved.

A. The proof in both instances turns on the position of the major term in the premises, and in both it is the predicate of the major proposition.

Q. How many modes are there in the third figure?

A. There are six :

	1.	2.	3.	4.	5.	6.
Major premise	A	E	I	A	O	E
Minor premise	A	A	A	I	A	I
Conclusion	I	O	I	I	O	O

Contained in the mnemonic words, D*a*r*a*pt*i*, F*e*l*a*pt*o*n, D*i*s*a*m*i*s, D*a*t*i*s*i*, B*o*k*a*rd*o*, F*e*r*i*s*o*n.

Q. What are the special rules of the fourth figure?

A. In this figure, on account of the confused position of the terms, all the rules are hypothetic: by an easy analysis, we can discover, 1. that in negative modes the major will be universal; proved like the second rule of the second figure: 2. that if the minor be affirmative, the conclusion will be particular; proved as the second rule of the third figure: and 3. if the major be particular, the minor must be negative; for the middle term will then be particular, as subject of major; therefore, it must be universal in minor, where it is predicate, and consequently will render the minor negative.

Q. May not the rules of the fourth figure be otherwise expressed?

A. They may be converted by contraposition, and would then be thus expressed:—

1. If the major be particular, the mode will be affirmative.
2. If the conclusion be universal, the minor must be negative.
3. If the minor be affirmative, the major must be universal.

Q. May not the rules of the fourth figure be expressed categorically?

A. Two categorical rules are easily deduced from the hypothetics already given:—

1. O cannot be a premise.

2. A cannot be a legitimate conclusion.

Q. From what similarity between the second and fourth figures have they a rule similarly proved?

A. The proofs of the first rule of the fourth figure, and the second of the second figure, depend in both on the position of the major term, which in both is the predicate of the major proposition.

Q. From what similarity between the third and fourth figures have they a rule similarly proved?

A. The proofs of the second rules of the third and fourth figure, depend in both on the position of the minor term, which in both is the predicate of the minor proposition.

Q. What are the modes of the fourth figure?

A. There are five:—

	1.	2.	3.	4.	5.
Major premise	A	A	I	E	E
Minor premise	A	E	A	A	I
Conclusion	I	E	I	O	O

For which the mnemonic words are Br*a*m*a*nt*i*p, C*a*m*e*n*e*s, D*i*m*a*r*i*s, F*e*s*a*po, Fr*e*s*i*son [1].

Q. Which of the figures is the most perfect?

A. The first, for in that alone can a universal affirmative conclusion be deduced; in the second, the conclusion must be negative; in the third, particular; in the fourth, either negative or particular.

[1] The names of the modes are included in the following Latin lines:—

Barbara, Celarent, Darii, Ferio quoque primæ,
Cesare, Camestres, Festino, Baroko secundæ;
Tertia *Darapti* sibi vindicat atque *Felapton*,
Adjungens *Disamis, Datisi, Bokardo, Ferison;*
In quarta *Bramantip* sunt, *Carmenes, Dimarisque*,
Adjungens semper *Fesapo* atque *Fresison.*

TABLE OF THE MODES.

(The learner should exercise himself in investigating the reasons for the legitimacy and illegitimacy of these several modes. N.B. The numbers affixed to the conclusions of the legitimate modes, declare the figures in which they can be deduced.)

Major	A	A	A	A	E	E	E	E	I	I	I	I	O	O	O	O
Minor	A	E	I	O	A	E	I	O	A	E	I	O	A	E	I	O
Conclusion	A 1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Major	A	A	A	A	E	E	E	E	I	I	I	I	O	O	O	O
Minor	A	E	I	O	A	E	I	O	A	E	I	O	A	E	I	O
Conclusion	E	E 2·4	E	E	E 1·2	E	E	E	E	E	E	E	E	E	E	E
Major	A	A	A	A	E	E	E	E	I	I	I	I	O	O	O	O
Minor	A	E	I	O	A	E	I	O	A	E	I	O	A	E	I	O
Conclusion	* I 1 3·4	I	I 1·3	I	I	I	I	I	I 3·4	I	I	I	I	I	I	I
Major	A	A	A	A	E	E	E	E	I	I	I	I	O	O	O	O
Minor	A	E	I	O	A	E	I	O	A	E	I	O	A	E	I	O
Conclusion	O	†O 2·4	O	O 2	* O 1·2 3·4	O	O 1·2·3·4	O	O	O	O	O	O 3	O	O	O

* The inference in these figures is obtained by subalternation. † Unnecessary.

CHAPTER XVIII.

Further Considerations on the Modes and Figures.

Q. How may you determine, analytically, that A can be a conclusion in the first figure only?

A. Since the conclusion is affirmative, both premises must be affirmative, and since it is also universal, its subject, the minor term, must be universal in the minor proposition (second general rule); the minor term must therefore be the subject of the minor proposition, and the middle its predicate, and consequently particular; the middle term must therefore be universal in the major proposition, and to be so must be its subject: hence it appears, that A can be a conclusion only when the middle is the predicate of the minor, and subject of the major propositions; that is, in the first figure.

Q. Is there any proposition restricted as a premise?

A. O can be a minor proposition only in the second figure, and a major only in the third.

Q. How do you show, analytically, that O, as a minor premise, is restricted to the second figure?

A. Since minor premise is negative, the conclusion must be negative, and its predicate universal; the major term, or predicate of the conclusion, must therefore be universal in the major premise; but since the minor premise is negative, the major must be affirmative; the major term then must be its subject, and the middle, being its predicate, will be particular; it must therefore be universal in the minor premise, and to be so, must be its predicate: hence it appears, that O can be a minor premise in that

figure only which has the middle predicate of both, viz. the second.

Q. How do you investigate the figure in which O may be major premise?

A. Since one of the premises is supposed negative, the conclusion must be negative, and its predicate, the major term, universal; this term must be universal in the major proposition, which is supposed to be O, and therefore must be its predicate; the middle term then being particular, subject of the minor, must be universal in the minor, and must consequently hold the place of subject, for since the major is negative, the minor must be affirmative; O, therefore, can only be a major proposition in the figure where the middle term is subject of both premises, viz. the third.

Q. Is there any mode peculiar to the fourth figure?

A. The fourth is the only term in which an extreme is taken more universally in the premises than in the conclusion.

Q. What is the only extreme so taken?

A. The major; for if the minor be universal in the premises, it *may be* so in the conclusion; and it is useless to draw a particular conclusion when we can have a universal.

Q. How do you discover by analysis the figure in which the major extreme is particular in the conclusion, and universal in the premises?

A. The major extreme being particular in the conclusion, the conclusion itself, and therefore both premises must be affirmative; but since the major extreme must be universal in the premises, it must be subject of the major proposition, therefore the

middle term, as predicate of major premise, being particular, must be universal in minor, and to be so must be its subject: therefore, the major extreme can be particular in premise, and universal in conclusion, only in that figure which has the middle for predicate of major premise, and subject of minor, viz. the fourth.

Q. What mode is common to all the figures?

A. E I. O.

Q. Why?

A. All the conditions of the general rules will be fulfilled, whatever be the position of the terms in the premises.

Q. Why is not I. E. O. a legitimate mode?

A. Because the major term, which is universal in the conclusion, would be particular in the major premise, whether it were made the subject or predicate.

Q. Why is A. E. O. marked a useless mode?

A. As the minor term, whether subject or predicate, must be universal in the minor proposition, we can have a universal conclusion in every figure which can have these premises.

Q. Why then is E. A. O. a useful mode?

A. Because the conclusion from these premises must be particular in those figures in which the minor term is predicate of the minor proposition.

Q. What conclusion admits the greatest variety of premises?

A. A particular negative.

CHAPTER XIX.

The Aristotelic doctrine of syllogisms.

Q. On what principles did Aristotle establish the doctrine of syllogisms?

A. On what are called the rules *de omni* and *de nullo,* both of which are comprised in the following aphorism:—

Whatever is predicated affirmatively or negatively of a term, taken in its entire extension, may be predicated in like manner (that is, affirmatively or negatively) of any thing contained under that term.

Q. To which of the figures is this principle applicable?

A. To the first only.

Q. Why?

A. Because in the first, the major is predicated of the middle, and the minor is contained in the middle, whence we immediately infer the predication of the major respecting the minor; but in the other figures, as the terms are not disposed in their natural order, the necessity of the consequence is not immediately perceivable.

Q. Why do you say their *natural order?*

A. Because if we observe the process which usually takes place in our own minds, we shall see that our reasoning, for the most part, assumes the form of the first figure; for we first endeavour to obtain some general rule, and then investigate how far the particular instance is contained under the rule.

Q. Can you illustrate this by a common example?

A. In all criminal trials, the law defining the crime

is the major proposition; the nature of the action committed by the prisoner is the minor proposition; and the verdict of the jury is the conclusion.

Thus: "To kill a man wilfully, maliciously, and unlawfully, is murder.

"M. N. did kill a man wilfully, maliciously, and unlawfully.

"Therefore M. N. is guilty of murder."

Here the law supplies the major proposition; the prosecutor furnishes the minor; and the jury draw the conclusion from the premises.

Q. Has not this simple distinction been frequently neglected?

A. Yes; from not keeping the propositions sufficiently distinct, jurymen have frequently required proof of the major, and thus interfered with the province of the court; and, on the other hand, instances have occurred of judges directing their attention to the minor, the consideration of which belongs to the jury.

Q. How did Aristotle distinguish the modes of the first figure from those of the others?

A. He called the modes of the first figure perfect, and the others imperfect.

Q. What are the attributes of a perfect mode?

A. 1. The middle term must be the predicate of its minor, and the subject of its major.

2. The minor premise must be affirmative, and the major universal.

3. The conclusion must have the quantity of the minor, and the quality of the major premise.

Q. How do you prove the first and second?

A. It is manifest from the principle on which Aris-

totle has founded the doctrine of syllogisms; for there must be some general rule laid down about some universal term, of whose extension the subject of the conclusion forms a part.

Q. How do you prove the third?

A. The conclusion must have the quantity of the minor; for that part alone of the universal term, or universal whole, determined in the premises, can be introduced into the conclusion; and it must have the quality of the major, for whatever has been predicated of the universal whole, must also be predicated of its parts.

CHAPTER XX.

Reduction.

Q. How are imperfect modes changed into perfect?

A. By reduction, which is of two kinds, ostensive and indirect.

Q. What is ostensive reduction?

A. That which from the premises of the imperfect mode gives the conclusion in a perfect mode, or a conclusion immediately inferring it by conversion.

Q. What is the imperfect mode called?

A. It is called the reducend, and the perfect mode formed from it is termed the reduct.

Q. How do the names of the imperfect modes suggest the perfect modes into which they are to be reduced?

A. The initial letter of the reducend and reduct modes are the same; S or P following a vowel in the reducend, shows that the proposition must be con-

verted to make it admissible in the reduct mode; M. or N. declares that the reducend premise must be transposed; and K. declares the imperfect mode to be incapable of direct or ostensive reduction.

Q. What then are the perfect and imperfect corresponding modes?

A. *Imperfect modes.*	*Perfect modes.*
Bramantip	Barbara
Cesare, Camestres, Camenes	Celarent
Darapti, Disamis, Datisi, Demaris	Darii
Festino, Felapton, Ferison, Fesapo, Fresison	Ferio
Baroko, Bokardo } incapable of ostensive reduction.	

Q. Give me an example of ostensive reduction?

A. *Reducend or imperfect mode.*

Ce- —— No body shining by its own light changes its phases.
-sa- —— The moon changes its phases.
-re. —∴ The moon does not shine by its own light.

Reduct or perfect mode.

Ce- —— No body changing its phases shines by its own light.
-la- —— The moon changes its phases.
-rent. —— The moon does not shine by its own light.

Q. How is the second figure reduced to the form of the first?

A. By the conversion of the major; for the minor propositions in both have the terms in the same order.

Q. When will this change be sufficient?

A. When the minor proposition is affirmative; for in the second figure the major is always universal.

Q. When is a further change necessary?

A. When the minor is a universal negative, the premises must be transposed; when it is a particular negative, ostensive reduction is inapplicable.

Q. How is the third figure reduced to the form of the first?

A. By the conversion of the minor; for the terms are in the same order in the major propositions of both.

Q. When will this be sufficient?

A. When the major is universal; for in the third figure the minor is always affirmative.

Q. When will transposition be also necessary?

A. When the major is a particular affirmative; but if it be a particular negative, ostensive reduction is inapplicable.

Q. How is the fourth figure changed into the form of the first?

A. Either by simple transposition, or by the conversion of both premises.

Q. When will transposition suffice?

A. When the minor is universal, and the major affirmative.

Q. When transposition of premises is used in reduction, will the reduct conclusion be precisely the same as the conclusion of reducend?

A. No; when the premises are transposed, the terms of the conclusion must be transposed likewise; and the conclusion of the reducend must then be derived from the conclusion of the reduct by conversion.

Q. Is there any mode in which it can be determinately shown that the conclusion of reducend is the convertend of the conclusion of reduct?

A. Yes; *Bramantip* is such a mode, and there is no other.

Q. How do you prove this?

A. In order that such a relation should be determinable, the convertend must be a universal affirmative, and the converse a particular affirmative; for the converses of universal negatives, and particular affirmatives, do not differ from their convertends in quantity; now as the conclusion of reduct is convertend to conclusion of reducend, it must be a universal affirmative, and its subject being universal in the conclusion, must have been universal in reduct premises, and also in the premises of reducend from whence they were derived; but as conversion is necessary in the conclusion, transposition must have taken place in the premises, and consequently the universal minor of the reduct is a universal major in the reducend; but since the conclusion of the reducend is affirmative, its predicate, the major term, is particular, but it is universal in the premises, and therefore the reducend mode is *Bramantip* in the fourth figure, as has been already shown in the seventh paragraph of the eighteenth chapter.

Q. How do you shew the validity of ostensive reduction?

A. The premises of the reducend are supposed to be true, therefore the premises of the reduct being derived from them by a legitimate process, are true likewise; since, in the first figure, the conclusion is the necessary result of the premises, the conclusion of the reduct is true, and this is either the same as the conclusion of reducend, or infers it by a legitimate process of conversion.

CHAPTER XXI.

Indirect Reduction.

Q. What is indirect reduction ?

A. That in which, from the contradictory of the conclusion, and one of the premises, a conclusion is deduced that contradicts the other premise [1].

Q. What is the process of reasoning in indirect reduction ?

A. The premises of the reducend are supposed to be both true, therefore the conclusion of the reduct, which contradicts one of them, is false; since the conclusion of the reduct is false, one of the premises of the reduct must be false, and this must be the new premise, or contradictory of reducend conclusion; since, then, the contradictory of reducend conclusion is false, reducend conclusion must be true. (See Chap. XI.)

Q. Give me an example of indirect reduction.

A. *Reducend or imperfect mode.*

Ce- —— No body shining by its own light changes its phases.

-la- —— The moon changes its phases.

-re. —∴ The moon does not shine by its own light.

Reduct or perfect mode.

Bar- —— No body shining by its own light changes its phases.

-ba- —— The moon shines by her own light.

-ra. —∴ The moon does not change her phases.

[1] Before proceeding with the investigations of this chapter, the student should carefully go over the eleventh chapter.

Q. In this instance, the conclusion of reducend contradicts the minor premise of reducend, but from the letters there would appear to be only contrariety between them. How do you explain the apparent error?

A. You have mentioned the reason that led to the selection of this very example: in addition to the demonstration of the principles of indirect reduction, it is of importance to show the extensive and accurate application of which logical reasoning is susceptible, and that apparent violations of the forms of its rules are still regulated by its strictest principles.

Q. Is that exemplified in the present instance?

A. Yes; the moon being applicable only to one individual is a singular term, therefore the proposition of which it is the subject must be universal; the conclusion from two universals being universal in the first figure, the reduct is both a universal and singular, but the opposition between two singulars is contradiction. In another part of this chapter, however, it will be shown, that contrariety which might arise in this case would be an opposition perfectly sufficient for the process of reasoning.

Q. Has this indirect process of reduction any other names?

A. It is commonly called by the old logicians *reductio ad impossibile*, and *reductio ad absurdum*.

Q. What changes are made in the terms of the reducend by indirect reduction?

A. The extreme of preserved premise of reducend becomes the middle term of the reduct; the middle of reducend takes in the reduct the name of the ex-

treme of the preserved premise; the extreme of the suppressed premise preserves its name.

Q. How do you prove this?

A. Since the extreme of the preserved premise occurs once there in the premises of the reduct, and once again in the contradictory of the conclusion, it must be the middle term of the reduct, for that term alone occurs twice in the premises of a syllogism: since the former middle occurs but once in the premises of reduct, it must become an extreme; and since it occurs only in the preserved premise, it will be the extreme of that premise: finally, since the extreme of the suppressed premise holds the same situation in the substituted premise (viz. the contradictory of the conclusion), it must retain its former name.

Q. Which is the suppressed premise in the second figure?

A. The minor.

Q. Why?

A. Since the major premise is preserved, the major term will become the middle; but it is the subject of the preserved premise, and will be the predicate of the substituted premise, for it is the predicate of reducend conclusion, and consequently of its contradictory also.

Q. Will the reduct mode then fulfil the conditions of a perfect mode?

A. Yes; the preserved major will be universal, for it is always so in the second figure; and the substituted minor will be affirmative, for it is the contradictory of the conclusion, which in the second figure is always negative.

Q. Which is the suppressed premise in the third figure?

A. The major.

Q. Why?

A. Since the minor is the preserved premise, the minor term becomes the middle, but it is the predicate of the preserved premise, and will be of course the subject of the substituted premise (viz. the contradictory of reducend conclusion).

Q. Will the reduct mode in this case be perfect?

A. Yes; the preserved minor will be affirmative, for it is always so in the third figure; and the new major will be universal, as being the contradictory of the conclusion, which in the third figure is always particular.

Q. Which is the suppressed premise in the fourth figure?

A. The fourth figure is reduced tc the form of the first by substituting the contradictory of the conclusion for either of the premises.

Q. Why?

A. If contradictory of conclusion be substituted for major premise, the minor term becomes middle, and is subject of major and predicate of minor; if it be substituted for minor premise, the major term becomes middle, and is the subject of major and predicate of minor, as is required in a perfect mode.

Q. How then do we determine the suppressed premise in this figure?

A. By the nature of the conclusion: 1. if it be a particular affirmative, the major must be suppressed; 2. if it be a universal negative, the minor must be suppressed; 3. if it be a particular negative, either premise may be suppressed indifferently.

Q. How do you prove the first part?

A. If the conclusion be a particular affirmative, its contradictory will be a universal negative, and consequently only admissible as a major in the first figure.

Q. Will the mode then be perfect?

A. Yes; the major, as we have shown, will be universal, and the minor must be affirmative, since the conclusion is so.

Q. How do you prove the second part?

A. The contradictory of a universal negative conclusion is a particular affirmative, which is only admissible as a minor in the first figure.

Q. Will the mode then be perfect?

A. Yes; for the minor, as we have shown, will be affirmative, and the major will be universal, for it is so in all the negative modes of the fourth figure.

Q. How do you prove the third part?

A. The major is universal and the minor affirmative in the modes of the fourth figure, which have a particular negative conclusion; consequently, either may be preserved without violating the rules of perfect modes; and the contradictory of the conclusion being a universal affirmative, may become either major or minor premise of reduct.

Q. What is there remarkable in the indirect reduct modes of the fourth figure?

A. The terms of reduct mode are always in the reverse order of the terms in the suppressed premise.

Q. Why?

A. Because the middle term of reducend premise changes its name for that of the extreme in preserved premise, and will therefore be predicate of conclusion

when the minor is suppressed, and subject when the major is suppressed; but in the fourth figure, the middle term is subject of minor and predicate of major.

Q. What species of opposition is principally used in the process of indirect reduction?

A. Contradiction.

Q. In how many ways is it applied?

A. In two ways: we argue from truth of suppressed premise to falsehood of reduct conclusion; and from falsehood of substituted premise to truth of reducend conclusion.

Q. Could the other species of opposition be used in either of these ways?

A. Yes: contrariety is a valid argument in reasoning from truth to falsehood; and subcontrariety in reasoning from falsehood to truth.

Q. Does contrariety ever arise?

A. Yes; whenever the reducend mode has a particular conclusion, and universal premises.

Q. Why will it arise in this case?

A. Because both premises of the reduct will be universal; and whenever this is the case in a perfect mode, the conclusion will be universal.

Q. Will the argument in this case be valid?

A. Yes; for the truth of the suppressed premise will prove the falsehood of the reduct conclusion.

Q. Could you not in this case make use of contradiction?

A. [1] Yes: by deducing a subaltern from the re-

[1] See the chapter on Subalternation (IX).

ducend premise, which would be true by the first canon of subalternation; and, consequently, its contradictory, the conclusion of the reduct syllogism, would be false.

Q. Could subcontrariety be used in the process of reduction?

A. No: the argument of subcontrariety would be valid between substituted premise and conclusion of reducend; but if thus used, it must also occur where it would be invalid, viz. between suppressed premise and conclusion of reduct.

Q. How is this proved?

A. In order that substituted premise should be subcontrary to conclusion of reducend, that conclusion must be O; for the subcontrary of I (viz. O) is inadmissible as a premise in a perfect mode: also, substituted premise must be the minor, for a particular is not admissible as major premise in a perfect mode; the mode must therefore occur either in the second or fourth figures: but when the conclusion is particular in the second figure, the minor is so likewise; and since the reduct has a particular premise, the conclusion of reduct will be particular, and therefore subcontrary to suppressed premise; in the fourth figure, the conclusion is particular only when the minor is affirmative; and as the terms of reduct conclusion are in reverse order to the terms of suppressed premise, it will be subcontrary to the converse of that premise.

CHAPTER XXII.

Hypothetical and disjunctive propositions.

Q. What is a hypothetical proposition?

A. That in which one or both premises are hypothetic propositions.

Q. What is the most common form of a hypothetic syllogism?

A. The major is usually a hypothetic proposition; the minor and conclusion both categorical. If both premises be hypothetic, the conclusion will be hypothetic likewise; and the proposition will partake of the nature of a Sorites, which shall be described hereafter.

Q. What are the legitimate processes of reasoning in hypothetic syllogism?

A. From the position of the antecedent to the position of the consequent; and from the remotion of the consequent to the remotion of the antecedent.

Q. What do you mean by position and remotion?

A. Position is the assertion of a proposition preserving its quality; remotion is the assertion of a proposition after its quality is changed to the opposite.

Q. What are the illegitimate processes of reasoning in hypothetic syllogisms?

A. From the remotion of antecedent to the remotion of consequent; or from the position of consequent to the position of antecedent.

Q. How do you prove this?

A. It appears from what we have already stated (Chap. XIII.), that the truth of a hypothetic proposition depends on the validity of the inference of the

consequent from the antecedent; now the same consequent may follow from several antecedents, therefore, the remotion of one antecedent cannot remove the consequent, nor the position of the consequent prove that particular antecedent.

Q. Can you illustrate this by an example?

A. Suppose the hypothetic major to be—

"If the moon revolves round the earth, she is a satellite."

Now it is evident, that if the first part be true, the second follows from it by necessary inference; and if the consequent be false, the antecedent must be so likewise; but no inference could be deduced from the remotion of the antecedent or position of the consequent, because there are other planets besides the earth that have satellites.

Q. How are the legitimate processes of reasoning in hypothetic syllogisms designated?

A. When we argue from position of antecedent to position of consequent, the syllogism is termed Constructive; when we reason from remotion of consequent to remotion of antecedent, the syllogism is called Destructive.

Q. Can a constructive be changed into a destructive syllogism?

A. Yes: by the conversion of the hypothetic major by contraposition; thus, the example given above would become—

If the moon is not a satellite, she does not revolve round the earth;

And it will be at once evident, that the destructive reasoning from this form of the proposition, is pre-

cisely equivalent to the constructive reasoning, from its convertend and *vice versâ*.

Q. What is the most usual form of a hypothetic proposition?

A. The antecedent and consequent have, for the most part, a common subject; if they have not, it will be found convenient to change them into this form by conversion. If they have not a common term, some part of the reasoning must have been omitted, which should be supplied before it is subjected to the strict examination of logical rules.

Q. When will a hypothetic affirmative of this form be true?

A. It will be true when the extension of the predicate of the antecedent is contained in the extension of the predicate of the consequent.

Q. When will a hypothetic negative be true?

A. When the extension of the predicate of the consequent is contained in the extension of the predicate of the antecedent.

Q. On what principle do these rules depend?

A. On the aphorism mentioned in the beginning of Chap. XIX., which is equally the foundation of reasoning in hypothetic and categorical syllogisms.

Q. What is disjunctive syllogism?

A. That in which the major is a disjunctive proposition; as the truth of a disjunctive proposition depends on the subject being contained in one or more of the predicates; therefore, some of the parts must be true and the rest false.

Q. How many processes of reasoning are there in disjunctive syllogisms?

A. Two: constructive and destructive; constructive, when from the remotion of one or more parts you argue to the position of the rest; destructive, when from the position of one or more parts you argue to the remotion of the rest.

Q. Can you give me an example?

A. *Disjunctive major.*

The world is either eternal, or the work of chance, or created by a Deity.

Destructive minor.

It is neither eternal, nor the work of chance.

Constructive conclusion.

The world has been created by a Deity.

or, *Constructive minor.*

The world has been created by a Deity.

Destructive conclusion.

It is neither eternal nor the work of chance.

Q. On what does the validity of the reasoning in a disjunctive syllogism depend?

A. On the aphorism mentioned in Chap. XIX., as will evidently appear on the slightest consideration.

Q. What is a dilemma?

A. It is a more complicated form of disjunctive syllogisms, and partakes more directly of the nature of hypothetic syllogisms.

Q. How are dilemmas divided?

A. Into constructive and destructive; and these again are subdivided into simple and complex.

Q. What is a simple constructive dilemma?

A. The major is a compound hypothetic proposition, containing several antecedents and a single consequent; the minor is a disjunctive proposition,

affirming the antecedents; the conclusion is a categorical affirmation of the single consequent.

Q. Can you give an example of this process of reasoning?

A. *Hypothetic Major.*

If the disappearance of Christ's body from the sepulchre be left wholly unexplained, or if such an explanation be given as is wholly irreconcileable with the ordinary principles of human action, we must believe the doctrine of the resurrection.

Disjunctive Minor.

The opponents of the doctrine are either totally silent, or give such explanations as contradict the plainest principles of action.

Categorical Conclusion.

We must believe the doctrine of the resurrection.

Q. What is a complex constructive dilemma?

A. That in which the major has several consequents, and the conclusion is of course disjunctive.

Q. Can you give me an example?

A. *Hypothetic major.*

If the conduct of general Mack at Ulm was premeditated, he was a knave; if unpremeditated, he was a fool.

Disjunctive minor.

It must have been either premeditated or unpremeditated.

Disjunctive conclusion.

Mack was either a traitor or a fool.

Q. What is a simple destructive dilemma?

A. It differs from the constructive in the disjunctive minor, which removes all the antecedents; and

the categorical conclusion then removes the consequent [1].

Q. Can you give me an example?

A. *Hypothetic major.*

If the Gospels be false, the evangelists must either have been deceivers or deceived.

Disjunctive minor.

They were not deceivers (for they testified to the truth of their doctrine by lives of suffering and deaths of torture); neither were they deceived (for the nature of the facts they record preclude the possibility of deception).

Categorical conclusion.

The Gospels are not false.

Q. On what does the truth of a dilemma depend?

A. On the accuracy of the division in the disjunctive proposition, and in the completeness of the proof of the remotion or position of the several parts in the minor; each of which parts should be demonstrated by a categorical syllogism.

Q. What else do the old logicians require in a dilemma?

A. That it should be incapable of being retorted; and of this they gave the following strange illustration. A sophist engaged to teach a pupil logic, on the condition of receiving a certain sum, when the pupil should conquer him in disputation. Shielding himself under the terms of the agreement, the dis-

[1] By making similar changes in the definition of a constructive complex dilemma, the student will have the definition of a destructive complex dilemma.

ciple refused to pay for his education, and the matter was brought to trial before the Athenian court. The sophist pleaded, "*If I conquer, I must be paid by the rule of court; and if I fail, I must be paid by the terms of our agreement:*" to which the student replied, "*If I conquer, I must not pay by the rule of court; and if I fail, I must not pay by the terms of our agreement.*"

Q. Is this a necessary rule?

A. No; for as in the case quoted, a dilemma can be retorted only when one hypothesis is destructive of the other.

CHAPTER XXIII.

Of Enthymemes and a Sorites.

Q. What is an enthymeme?

A. A syllogism, of which one premise is suppressed?

Q. How may we know which premise has been suppressed?

A. If the predicate of the conclusion occurs in the preserved premise, the minor has been suppressed; if the predicate, the major. But if neither, the enthymeme does not form part of a simple syllogism.

Q. How may we know to what figure of syllogisms the enthymeme belongs?

A. By completing the syllogism, and comparing it with the general rules.

Q. What is a sorites?

A. It is a series of propositions so disposed, that the predicate of the first is the subject of the second; and so on in succession, until in the conclusion, the last predicate is predicated of the first subject.

Q. Can you give me an example of a sorites?

A. "Those whom God foreknew, he predestinated;
Those whom he predestinated, he called;
Those whom he called, he justified;
Those whom he justified, he glorified:"
Therefore, Those whom God foreknew, he glorified.

Q. On what does the perfection of the reasoning in a sorites depend?

A. On the perfection of the simple syllogisms into which it is resolved.

Q. How is a sorites resolved into syllogisms?

A. The second premise of the sorites will be the major of the first syllogism, and the first the minor; the other syllogisms will have the successive propositions for their major premise, and the conclusions of the preceding syllogisms as their minors; therefore, the number of syllogisms into which a sorites is resolvable, must be one less than the number of premises in the sorites.

Q. What are the special rules of a sorites?

A. The first premise alone can be particular, and the last alone negative.

CHAPTER XXIV.

Of Sophisms.

Q. What is a sophism?

A. An argument, which under the appearance of rectitude, is fallacious. A false argument, manifestly violating the rules of syllogism, is called a paralogism, but in sophisms, the rules, though really broken, appear to be preserved.

Q. How are sophisms divided?

A. Into two classes; sophisms in form and sophisms in matter, termed by the old logicians, *Fallaciæ in dictione*, and *fallaciæ extra dictionem.*

Q. How many species of fallacies in form were enumerated by the old logicians?

A. Six: viz.—

1. The fallacy of equivocation, which consists in using the same word in different senses. Thus, Roman Catholics sometimes endeavour to prove, that even Protestants acknowledge the authority of the Church, since they receive the Scriptures on its *authority*. In the former part of the sentence, authority signifies controlling power; in the latter, it merely means evidence.

2. The fallacy of amphiboly, or doubtful construction of a sentence. Thus, Hume's argument against miracles, when he says, "No evidence can prove a miracle; for it is contrary to experience, that a miracle should be true, but not contrary to experience that evidence should be false," is an instance of this and the former fallacy combined; for in the first part of the sentence, *contrary to experience*, means, "wholly opposed to universal experience," which is a direct assumption of the point at issue; and in the second part, it merely means, inconsistent with the personal experience of some particular individual, which, from its nature, every miracle must be.

3. and 4. The fallacies of composition and division, where, from what is true of a term in its divided sense, we infer something respecting the aggregate, or the contrary. Thus, the Stoics endeavoured to prove the doctrine of necessity by the following argument:

"He, who necessarily goes or stays, is not a free agent;" "you must necessarily go or stay;" therefore, "you are not a free agent." Here the fallacy rests on the word *necessarily* being taken with both members in the first proposition, and only with the alternative in the second.

5. Fallacy of accent; or a play on words of the same sound but different sense. This is nothing better than a quibble or pun, by which no rational being was ever deceived.

6. Fallacy of figure of speech, or a fallacy arising from the grammatical construction of language, and proceeding on the false supposition, that all words derived from the same root have a correspondency in meaning. It is impossible to give such a fallacy a logical form, as the syllogism will be at once seen to contain two middle terms.

Q. How many fallacies in matter (*extra dictionem*) are there?

A. The old logicians enumerate seven. 1. Fallacy of accident, where some accidental circumstance is assumed as essential. Thus, certain reasoners blame Christianity as the origin of religious wars, not perceiving that these wars arose, not from Christianity itself, but from the depraved passions of its professors.

2. The fallacy of arguing from a modal to a simple assertion *(a dicto secundum quid ad dictum simpliciter)*, thus, some opponents of war say, that those who support the right of self-defence, are advocates of murder, omitting all notice of the circumstances by which they restrict their assertions.

3. The fallacy of erring conclusion *(ignorationis elenchi)*: this fallacy consists in proving something

which inaccurate observers might be led to mistake for the question at issue. Thus, the opponents of machinery prove that it has injured some particular classes, not regarding that the matter really to be decided is, whether its introduction has not been, on the whole, beneficial to the nation at large.

4. The fallacy of wrong cause, or unreal similarity, in which an effect is deduced from a false source, or a case quoted as similar, which is by no means parallel.

5. The fallacy of consequent, where something is deduced which does not necessarily follow.

6. The fallacy of assumption *(petitionis principii)*, in which the question at issue, or something inferring it, is assumed as a premise. To this belongs the argument in a circle, where two doubtful propositions are used to prove each other. This is a very common sophism with popular orators, who frequently give their hearers identity of assertion for argument.

7. The sophism of several questions, when a single answer is required to a question that may receive several; thus, "Is it just to kill a man?" is a question which an inaccurate reasoner would promptly answer in the negative; and subsequently be surprised to find that he had given up the right of self-defence, and denied in all cases the legality of capital punishment.

THE END.

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